

Healthpoint

Information from the Division of Health Care Finance and Policy

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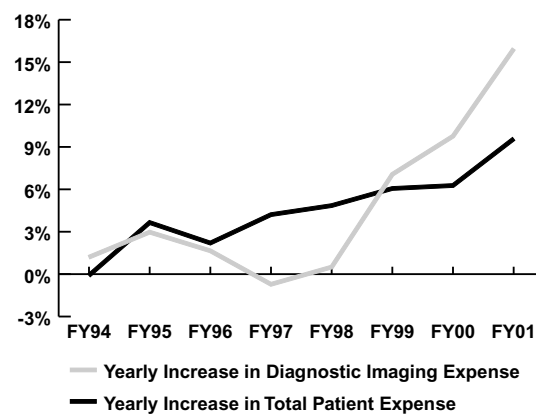
DIAGNOSTIC IMAGING: A NEW COST DRIVER

once again in the news, much attention is focused on the question of which components of the premium are driving the increases. Pharmacy costs, while still increasing, have begun to moderate. However, a new area of concern has emerged: diagnostic radiology services. From FY99 through FY01, the combined expenses of three different types of imaging services—diagnostic radiology, Computed Tomography (CT) scans, and nuclear medicine—exceeded the average rate of increase in overall expenses in Massachusetts hospitals, after at least five years of low growth (see figure).¹ Although the aging population may account for some of the increase in utilization, technological advances, the penetration of radiological services throughout medicine, patient demand, and other developments have had a greater effect.

This issue of *Healthpoint* focuses on the factors causing the rapid increase in the cost of diagnostic radiology, the clinical gains attributable to the growth in radiology services, and strategies that might be adopted to control this growth.

With steep increases in health care premiums

Rate of Increase in Diagnostic Imaging and Total Patient Expense, FY94-FY01



Division of Health Care
Finance and Policy

Two Boylston Street
Boston, MA 02116
(617) 988-3100

Christine C. Ferguson
Acting Commissioner

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Cost Drivers

In a recent national survey, physicians named magnetic resonance imaging (MRI) and CT scans as the two most important medical advances of the past 30 years.² Improved diagnostic capability though, often comes with a high price tag—as much as \$2.5 million for each MRI machine. At the same time, the development of relatively cheap imaging equipment that produces high-quality images has enabled the proliferation of this equipment into physician offices. Radiology procedures have become so widespread throughout medical practice that a recent analysis found that New England physicians in 38 different specialties had billed Medicare for the interpretation of radiology results.³

This diffusion of technology into so many specialties has blurred the traditional distinction between the physician who orders radiology procedures and the radiologist who performs and interprets the results. X-ray equipment in orthopedic suites, ultrasound machinery in obstetrics offices, and cardiovascular imaging devices in cardiology practices all increase patient convenience, and eliminate the need for the radiologist “middleman,” while providing an additional revenue stream for the treating physician. Physician self-referral, regulated by Medicare and Medicaid, but not by other insurers, has been shown to be associated with higher utilization rates.⁴

Not only has the use of diagnostic imaging diffused to many medical specialties, it has spread geographically to both community hospitals and local non-hospital imaging centers. Community hospitals acquire the newest radiology equipment to compete with tertiary hospitals in attracting physicians and patients. When patients must go to tertiary hospitals for diagnostic tests, community hospitals often lose them for the entire treatment cycle. Moreover, some diagnostic radiology services may be profitable, even when no therapeutic treatment is provided.

Other factors may also increase utilization. Direct-to-consumer advertising has touted whole-body scans as appropriate for healthy consumers despite controversy over the value of such scans. Technological advances increase the patient-friendliness of certain tests, such as “open” MRI machines that minimize claustrophobia and CT scanners that perform exams 8-16 times faster than older models. The availability of colonography, a virtual examination of the colon, is likely to motivate more adults to submit to colon cancer screening since the more invasive colonoscopy is widely disliked. Finally, physicians explain some overuse of diagnostic testing as defensive behavior resulting from their fear of malpractice suits.

While some payers and purchasers report that the number of diagnostic tests performed is rapidly increasing, the intensity of service may also be increasing as expensive CT and MRI scans become more commonplace. Expansion of insurance coverage for new technologies, such as Medicare coverage of PET (positron emission tomography) scans to monitor the progress of breast cancer patients, will inevitably boost the utilization of those procedures. On the other hand, non-invasive CT scans are replacing more costly and dangerous angiograms to diagnose clogged arteries, and three-dimensional imaging is giving surgeons a better idea of what to expect during surgery. In some cases, the detail revealed in higher-quality imaging may negate the need for surgery altogether. Furthermore, it is estimated that three-dimensional imaging costs 65%-75% less than invasive diagnostic procedures.⁵

Issues

There is no doubt that many advances in diagnostic imaging have been tremendously beneficial to patients. However, under- and over-utilization of various procedures among subgroups of the population have not spread the benefit uniformly or with maximum efficiency. Racial and ethnic disparities in cardiac testing were recently documented despite controlling for the severity of the patient’s illness.⁶ In addition, some proven screening tests like mammography are not performed as widely or frequently as recommended (see table).⁷

Conversely, whole body scans on the “worried well,” widely regarded as having minimal benefit, have the additional disadvantage of triggering expen-

Mammography Rate by Residency, 1999

Screenings per 1,000 Female
Medicare Enrollees, Ages 65 to 69

Boston	508.1
Springfield	477.1
Worcester	403.1
United States	436.4

Note: An annual or bi-annual mammography is recommended for all women ages 50 to 69 (500 tests annually per 1,000 in this age group).

sive and sometimes risky follow-up care due to false-positive findings in the scan. Insurers, even when they have not paid for the scan, usually pay for the follow-up care. One study reported this year found that nearly half of all body scans show one or more abnormalities, even though just one percent is likely to indicate a serious illness.⁸

Despite rapid growth in many types of radiology services, there exists considerable concern about the adequacy of current and future capacity to meet demand. Already at some Massachusetts hospitals, appointments must be made far in advance for screening services such as mammography and colonoscopy, primarily due to a shortage of qualified staff. While growth in the supply of radiologists has been somewhat more rapid than that in most other specialties over the past 25 years, it may be that demand for radiology procedures has grown even more rapidly. The Massachusetts Medical Society rates radiology among the top eight specialties currently experiencing high vacancy rates statewide. Hospitals report vacancy rates of 10% or more for technicians in radiology, radiation therapy, ultrasound, and nuclear medicine, although the 10% vacancy rate among nurses garners far more attention.⁹

Strategies

Payers and purchasers have implemented a number of strategies to bring pharmaceutical costs under control, some of which may be models for managing radiology usage. Diagnostic imaging, however, is different from pharmacy in that it is a service, not a commodity. Except for short periods when new services are introduced, there are typically many alternative providers of these services. There is no parallel to the single-source drug, so often the villain in discussions of pharmacy costs.

Theoretically, selective contracting by insurers for radiology services is possible, although practically, this may be suitable only for the more infrequent, expensive procedures in cases where a result is not needed immediately. Currently, most radiology services are too integral to the provision of care to remove them from their usual service location. However, the increasing availability of digital equipment to produce, transmit, and store radiological images will decouple where imaging services are provided, interpreted, and perhaps, also where treatment occurs, raising thorny questions of accountability, credentialing and quality assurance. Massachusetts General Hospital, for example, uses radiologists in Bangalore, India to interpret CT scans,¹⁰ and the Medical Center of Central Georgia transmits second and third shift CT scans to radiologists in Australia, eliminating the need for and expense of on call radiologists.¹¹

Payers and policy makers may want to consider carefully the concerns raised by physician self-referral. Both Medicare and Medicaid have self-referral restrictions pertinent to radiology services, although there are various exemptions. Some states have passed statutes that regulate physician self-referral of private-pay patients as well, although Massachusetts is not one of them.

Tiered copayments are another possibility, although their potential for limiting utilization in this area is unproven. To the extent that patients are requesting more expensive versions of diagnostic procedures than they may need, increased cost-sharing might serve as a deterrent. Patient education campaigns, such as those concerning the appropriate use of antibiotics, might also be effective in discouraging patients from seeking inappropriate body scans or other unnecessary tests.

A better strategy might be to employ practice guidelines to encourage the use of imaging techniques that are appropriate in a given case. Since there is evidence of both over- and under-utilization of radiological procedures, further development and dissemination of practice guidelines seems promising. Linking reimbursement to such guidelines would further encourage adoption, as would

implementation through computerized physician order entry systems. One Massachusetts teaching hospital recently began to phase in a new evidence-based clinical system for diagnostic imaging. The system integrates multiple clinical databases to give physicians instant information for ordering appropriate imaging tests including outcomes data on thousands of similar patients. In the future, it will feature medical literature and best-practice guidelines for choosing the proper diagnostic imaging tests.

In the longer term, increased use of computerized medical records, especially those available through the Internet or local networks, may help to reduce utilization rates of diagnostic tests in general. Studies have found that 10% or more of diagnostic testing is due to retesting because test results were unavailable to the treating physician at the point of service. This could be largely eliminated by better access to patient information on a timely basis.¹²

As is true for pharmaceuticals, increased evidence of the value of certain tests to screen for common serious illnesses—electron-beam CT scans for coronary artery disease or low-dose spiral CT scans for lung cancer—could substantially increase costs in these areas in the next several years. While cost should not deter the emergence of truly valuable new technologies, attention must be paid to whether and how (and at what price) the emerging technology surpasses current technology. The extra cost of innovation must be proven to deliver value.

Endnotes

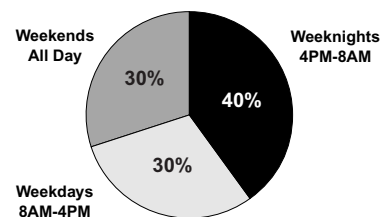
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Did you know?

Most ED Visits Occur when Other Options Are Not Available

The new DHCFP emergency department (ED) database includes data on patients treated in hospital EDs, but not admitted for an inpatient or observation stay. Analysis of these data shows that 70% of such ED patients arrived during evening and weekend hours, when most physicians' offices, clinics and health centers were closed. While many of these patients undoubtedly had emergencies, it is likely that some could have used more appropriate, less expensive settings had they been available.

Massachusetts ED Use by Day and Time, FY02



Kathy Fuda
Author
Susan Kennedy
Did you know?
Maria Schiff
Series Editor
Heather Shannon
Layout and Production
Shelley Fortier
Distribution and Library

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